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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,679	01/15/2004	Jeremy E. Dahl	005950-845	4958
21839	7590	10/23/2007	EXAMINER	
BUCHANAN, INGERSOLL & ROONEY PC			VENCI, DAVID J	
POST OFFICE BOX 1404			ART UNIT	PAPER NUMBER
ALEXANDRIA, VA 22313-1404			1641	
NOTIFICATION DATE		DELIVERY MODE		
10/23/2007		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/758,679	DAHL ET AL.	
	<b>Examiner</b> David J. Venci	<b>Art Unit</b> 1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on September 6, 2007.

2a)  This action is **FINAL**.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 29-40 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5)  Claim(s) \_\_\_\_\_ is/are allowed.  
6)  Claim(s) 29-40 is/are rejected.  
7)  Claim(s) \_\_\_\_\_ is/are objected to.  
8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on July 25, 2007 is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 09/06/07; 07/25/07.

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.

5)  Notice of Informal Patent Application

6)  Other: \_\_\_\_\_.

## DETAILED ACTION

Examiner acknowledges Applicants' reply, filed July 25, 2007. No amendment to independent claim 29 is made. Claims 30-38 are amended. Claims 1-28 are cancelled.

Claims 29-40 are pending and under examination.

### *Specification*

Throughout the disclosure, the proper noun "Verber" appears misspelled. Appropriate correction is required.

### *Drawings*

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "1001" is used to designate both "diamondoid-containing material" and "molecular crystal".

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 29-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 29, 36 and 38:

The term "heterodiamondoid" is indefinite. The identity of one or more member structures belonging to the class "heterodiamondoid" is not clear. According to Specification page 3, lines 26-27: "[a] heteroatom is essentially an impurity atom that has been 'folded into' the diamond lattice". Whether/how a "heterodiamondoid" possess a "diamond lattice" is not clear. How an atom is "folded into" a diamond lattice is not clear. The identity of one ore more objects and/or steps required for making or providing a diamond lattice having an atom "folded into" the diamond lattice is not clear.

In claim 35:

The essential structural cooperative relationship between "diamondoid" and "vacancy or pore" is not clear and appears omitted from the claim.

The essential structural cooperative relationship between "diamondoid lattice" and "vacancy or pore" is not clear and appears omitted from the claim.

The essential structural cooperative relationship between "diamondoid lattice site" and "vacancy or pore" is not clear and appears omitted from the claim.

The essential structural cooperative relationship between "carbon atom" and "vacancy or pore" is not clear and appears omitted from the claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 29-34 and 36-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Bronstein & Voyta (US 5,032,381).

Bronstein & Voyta describe a method of detecting a target analyte comprising the steps:

- (a) providing a heterodiamondoid-containing probe (see col. 9, Formula II);
- (b)(c) binding the heterodiamondoid-containing probe to the target analyte and exciting the biological label with energy (see col. 10, lines 29-32, “adding the chemiluminescent compound to the extracellular fluid so that it penetrates the cell and reaches the enzyme of interest that decomposes and activates said chemiluminescent compound”);
- (d) detecting light emitted from the excited biological label (see Title, “chemiluminescence”).

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Claims 29-34 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Bronstein (US 6,514,717).

Bronstein describes a method of detecting a target analyte comprising the steps:

- (a) providing a heterodiamondoid-containing probe (see col. 1, lines 35-40, "a dioxetane having the formula..."; see also, col. 2, lines 19-20, "group T of the dioxetane is a polycycloalkyl group, preferably adamantly"; see also, Table 1);
- (b)(c) binding the heterodiamondoid-containing probe to the target analyte and exciting the biological label with energy (see col. 11, lines 37-43, "a dioxetane [...] is added", "The enzyme cleaves group Z", "chromophore Y [...] is thus excited") (paraphrasing mine);
- (d) detecting light emitted from the excited biological label (see Abstract, "chemiluminescence").

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Claims 29-33 and 35-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Raymond *et al.* (US 6,864,103).

Raymond *et al.* describe a method of detecting a target analyte comprising the steps:

- (a) providing a heterodiamondoid-containing probe (see col. 36, line 3, "Recognition Moieties" see e.g., col. 37, line 25, "methenamine");
- (b) binding the heterodiamondoid-containing probe to the target analyte (see col. 36, lines 4-5, "'recognition moieties' [...] interact with an analyte") (paraphrasing mine);

(c)(d) exciting the biological label with energy and detecting light emitted from the excited biological label (see Title, "use as luminescent markers").

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 29-34 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang *et al.* (US 7,070,921) in view of Bronstein (US 6,514,717).

Huang *et al.* describe a method of detecting a target analyte comprising the steps:

- (a) providing a probe (see e.g., Fig. 6, "A");
- (b)(c) binding the probe to the target analyte and exciting the biological label with energy (see e.g., Fig. 6, "A ↔ A\*"; see also, col. 14, lines 37-40, "the detectable response may be generated directly using a luminophore associated with [...] A\*") (paraphrasing mine);
- (d) detecting light emitted from the excited biological label (see Abstract, "chemiluminescence").

Huang *et al.* do not describe a "heterodiamondoid-containing" probe.

However, Bronstein describe a heterodiamondoid-containing probe (see col. 1, lines 35-40, "a dioxetane having the formula..."; col. 2, lines 19-20, "group T of the dioxetane is a polycycloalkyl group, preferably adamantyl") for use in enzyme-amplified assays (see e.g., col. 2, line 48, "amplification effect").

It would have been obvious for a person of ordinary skill to perform the analyte detection method of Huang *et al.* with "heterodiamondoid-containing" probes because Bronstein discovered that "an external excitation energy source, e.g., light, is not necessary" with heterodiamondoid-containing probes. Furthermore, Bronstein discovered that heterodiamondoid-containing probes resulted in enzyme-amplified assays having optimal decomposition and luminescence kinetics (see col. 3, lines 3-12).

***Response to Arguments******Claim Rejections - 35 USC § 112***

In prior Office Action, claims 29, 37 and 38 were rejected under 35 U.S.C. 112, second paragraph, because the term "heterodiamondoid" is indefinite.

In response, Applicants argue the specification explicitly defines the term "heterodiamondoid" (*i.e.*, p. 15, lines 19-25) and provides exemplary synthesis of heterodiamondoids (*i.e.*, p. 15, lines 35 to p. 17, line 34).

Applicants' argument is not persuasive because the specification does not clearly define the term "heterodiamondoid". At most, the specification describes heterodiamondoids that, in "most" cases, are "typically" substituted with heteroatoms, but "may in some cases" find interstitial heteroatoms (see specification, p. 15, lines 19-25), which are somehow "folded into" a diamond lattice of a diamondoid (see specification, p. 3, lines 16-29).

Examiner acknowledges that the specification provides exemplary synthesis of heteroadamantyl derivatives at p. 15, lines 35 to p. 17, line 34, which Examiner posits, in "most" cases "typically" "may in some cases" not fall within Applicants' definition of "heterodiamondoid" especially if one feels heteroatoms are not "folded into" a diamond lattice of a diamondoid in any of the heteroadamantyl derivatives.

According to MPEP 2173.05(a), when there is more than one definition for a term, it is incumbent upon applicant to make clear which definition is being relied upon to claim the invention. Until the meaning of a term or phrase used in a claim is clear, a rejection under 35 U.S.C. 112, second paragraph is appropriate.

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*Prior Art Claim Rejections*

In prior Office Action, claims 29-40 were rejected under 35 U.S.C. 102(b) as being anticipated by Bronstein & Voyta (US 5,032,381). Claims 29-36 were rejected under 35 U.S.C. 102(e) as being anticipated by Bronstein (US 6,514,717). And, claims 29-38 were rejected under 35 U.S.C. 103(a) as being unpatentable over Huang *et al.* (US 7,070,921) in view of Bronstein (US 6,514,717).

In response, Applicants provide argumentation premised on the assertion that none of the cited prior art teach a "heterodiamondoid".

Applicants' argument is not persuasive because the cited prior art appear to describe impurity heteroatoms which appear "folded into" adamantyl derivatives. For example, Bronstein & Voyta (US 5,032,381) fold oxygen, phosphorous and metal impurity heteroatoms into an adamantyl derivative (see Formula II). Similarly, Bronstein (US 6,514,717) fold oxygen, "X", "Y" and "Z" heteroatoms into an adamantyl derivative (see col. 1, lines 35-40). In other words, both Bronstein & Voyta and Bronstein describe heterodiamondoids that, in "most" cases, are "typically" substituted with heteroatoms, but "may in some cases" find interstitial heteroatoms, which are somehow "folded into" a diamond lattice of a diamondoid.

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***Conclusion***

No claims are allowable at this time.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David J. Venci whose telephone number is 571-272-2879. The examiner can normally be reached on 08:00 - 16:30 (EST). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

David J Venci  
Assistant Examiner  
Art Unit 1641

djh

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